



REPORT
SUBSURFACE INVESTIGATION
RIVER ROAD
EDGEWATER, NEW JERSEY
PMK GROUP # 0200054



PRINCIPALS

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September 29, 2000

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ATTN: MR. ANTHONY SCOLPINO

REPORT
SUBSURFACE INVESTIGATION
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INTRODUCTION

This report presents the results of a subsurface investigation performed by the PMK Group along River Road in Edgewater, New Jersey. The site is depicted on the Site Location Map, Plate 1.

PROJECT BACKGROUND

The current alignment of River Road traverses an abandoned chemical facility. The structures within the facility were removed, however the pile supported foundations were left in place. In order to construct the new roadway, fill on the order of 4 to 5 feet in thickness was installed within some areas. It is our understanding that a 500 foot section of River Road has experienced varying degrees of subsidence and/or distress. Further, there is also a potential that subsurface utilities have been compromised as a result of this subsidence.

PURPOSE AND SCOPE OF WORK

The purpose of our services was to:

- 1. Explore the subsurface soil and groundwater conditions throughout the existing roadway;
- 2. Estimate the geotechnical engineering properties of the encountered subsurface materials;
- 3. Provide recommendations for remedial action along the existing road alignment necessary to correct the roadway distress.

To accomplish these purposes, a subsurface exploration program consisting of 38 supervised test borings was performed throughout the road, as well as the right-of-way area. The borings were advanced using truck mounted drilling equipment and extended to depths ranging from 32 to 72



Bergen County Department of Public Works Att: Mr. Anthony Scolpino September 29, 2000 Page 2

Project #0200054

feet below the existing surface grades. All boring locations are shown relative to the existing site features on the Boring Location Plan, Plate 2A.

All field work was performed under the direct technical observation of a geotechnical representative from the PMK Group. Our representative located the explorations in the field, maintained a continuous log of the explorations as the work proceeded, and supervised the soil sampling operations so as to develop the required subsurface information.

Soil samples, suitable for identification purposes, were also extracted from the borings at closely spaced intervals in accordance with the procedures of the Standard Penetration Test. For this test, a standard split barrel sampler measuring 2 inches in outside diameter, 1 3/8 inches inside diameter is advanced into the soil using a 140 pound weight falling 30 inches. The number of blows required to advance the sampler a distance of one foot is recorded and designated as the Standard Penetration Resistance. The Standard Penetration Resistance values, as well as detailed descriptions of the encountered materials, are presented on the individual Logs of Borings, Plates 3A through 3SS. The correlation between soil conditions and the standard penetration test is presented below in Table I-1. The soil samples were visually classified in accordance with the procedures of the Unified Soil Classification System described on Plate 4. Additionally, the generalized subsurface conditions are depicted on Plate 2B, Soil Profiles.

Table I-1 Correlation Between Soil Conditions and Standard Penetration Test

Table 1-1 Correlation Detween S	on Conditions and Standard	
Soil Type	Designation	Blows/Ft
Non-cohesive Soils: Sand/Gravel Soils	Loose	0-10
	Medium Dense	11-30
	Dense	31-50
	Very Dense	51+
Cohesive Soils: Clays/Silts	Very Soft	0-2
	Soft	3-4
	Medium	5-8
	Stiff	8-16
	Very Stiff	16-32
	Hard	33+

All soil samples were brought to our office where they were further examined in our soil mechanics laboratory and subjected to appropriate laboratory testing. The laboratory program included moisture content determinations, and Atterberg Limits. The results of the laboratory tests are presented on Plates 5A through 5C, Atterberg Limits.

The results of the subsurface exploration program and laboratory analysis have provided the basis for our engineering analysis and design recommendations. The conclusions and



Bergen County Department of Public Works Att: Mr. Anthony Scolpino September 29, 2000 Page 3

Project #0200054

recommendations presented herein are subject to the limitations attached as an Appendix to this report.

SITE CONDITIONS

<u>Surface Features:</u> The area is currently a paved 4 lane road. Areas of settlement on the order of 12 to 18 inches were observed within the roadway, as well as the right of way area along the east side of the road.

<u>Subsurface Conditions</u>: The explorations performed for this study indicate that the site is underlain by soils which are variable in nature. In general, the site was found to be blanketed by either a surficial layer of topsoil on the order of 4 to 6 inches in thickness or bituminous concrete on the order of 6 to 18 inches in thickness. It should be noted that several concrete slabs and/or foundations, on the order of 1 to 10 feet in thickness, were encountered within the upper fill soils in a majority of the explorations. The soil types encountered at the subject site can be described as follows:

<u>Fill:</u> These soils were encountered immediately below the surficial soils and can be described as loose to very dense silty sand and gravel soils with varying percentages of brick, wood, concrete and coal tar. This layer extended to depths ranging from 8 to 20 feet below the existing surface grades.

Organic Silt: This layer was encountered below the fill soils and can be described as soft to medium stiff organic silt. This layer extends to depths ranging from 15 to 40 feet.

Silty Sand/Sandy Silt: This layer was encountered below the organic silt and can be described as loose to very dense silty sand and/or medium stiff to very stiff sandy silt soils. This layer extended to the maximum depth explored, 72 feet below the existing surface grades.

Groundwater was encountered in all of the explorations at depths ranging from 5 to 15 feet below the existing surface grades. It should be anticipated that the groundwater level at the site may fluctuate in response to seasonal variations in the rainfall, temperature, surface runoff, and other factors at the time the explorations were performed.

CONCLUSIONS AND RECOMMENDATIONS

Based on our visual observations of the existing site grades in the area bounded by borings B-215 to B-231, as well as the area by borings B-209 and B-214, settlement on the order of up to 18 inches has occurred at the site. The 4 to 5 feet of additional fill required to obtain the proposed road grades has imposed additional load on the compressible soil layers, and thus initiated the settlement. Based upon our findings as well as additional information obtained from other sources, the amount of settlement observed within these areas is likely near or at the end of the total estimated settlement expected, due to the installed fill soils.



Bergen County Department of Public Works Att: Mr. Anthony Scolpino September 29, 2000 Page 4

Project #0200054

Initially, we recommend a monitoring program throughout the site in order to determine if any additional settlement will occur. We recommend installing approximately 30 survey points (pk nails) throughout the area. A benchmark should be established on the adjacent pile supported structure. The monitoring program should be performed for approximately 3 months or until the settlement is determined to be substantially complete.

Upon establishing that the settlement is complete, the upper 4 feet of fill from within the affected areas, and 20 feet beyond, should be overexcavated. The exposed soils should be proofrolled to a firm and unyielding consistency with a 10 ton smooth drum vibrator roller. Any areas determined to be loose should be selectively overexcavated and replaced with controlled compacted fill. It should be noted that all utilities must be located to avoid damage during the proofrolling operations. Additionally, it may be prudent to inspect and replace any utilities which may have experienced significant settlement

Fill, consisting of lightweight material, i.e. Solite, Elasticer, should be installed in lifts, each on the order of 8 to 12 inches in loose thickness and uniformly compacted to at least 95% of the maximum dry density as determined by ASTM D-1557 Test Procedures. This material would have an in place compactive weight of 45 pounds per square. We recommend performing the remedial work in sections in order to minimize the disturbance of traffic in the area.

Please contact us if you have any questions concerning the information contained in this report.

The following plates and appendix are attached and complete this report:

Plate 1 - Site Location Map

Plate 2A – Boring Location Plan

Plate 2B - Soil Profiles

Plate 3A - through 3SS - Logs of Borings

Plate 4 - Unified Soil Classification System

Plate 5A through 5C - Atterberg Limits

Appendix - Limitations

Respectfully submitted,

PMK Group

Gerald J. Perricone, P.E.

Vice President

GJP/GF/brm/gth/report/11452r8

Gregg Furson

Project Engineer





PLATE #1-SITE LOCATION MAP PMK#0200054



Boring #: Project #: B-200 0200054 6/27/00

Date Completed:
Ground Surface El:
Depth to Ground Water:

7'

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B-201 0200054 6/27/00

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Boring #: Project #: Date Completed: B-201 0200054 6/27/00

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B-202 0200054 6/15/00

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Depth to Ground Water:

B-203 0200054 6/27/00

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Undisturbed Tube Sample

Rock Core Sample Client: Bergen County DPW

Project: **River Road** Location: Edgewater, NJ Driller: HP

Hollow Stem Auger

☐ Mud Rotary ☐ Air Rotary

PLATE: 3D



Boring #: Project #: Date Completed: Ground Surface El: Depth to Ground Water:

B-204 0200054 6/25/00

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B-204 0200054 6/25/00

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B-205 0200054 6/27/00

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Boring #: B-206
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Ĺ	PN	/K					** Blows per fo	oot using 300# hammer	with 30 inch drop				
	•	LE	GEN		Sno-						Project Manager:	GF	
			· · · · · · · · · · · · · · · · · · ·	Split S Undis	turbe	i Sam d Tub	ipie e Sample				Field Engineer:	WS HP	
1			i	Rock	Core	Samp	ole				Driller:		
		Clie	nt: I	Berg	en C	oun	ty DPW				☑ Hollow Stem Au	ger	
	. [Proje ocatio	-	Rive							☐ Mud Rotary	• • •	
H		1 -		Edge	wat	er, N	J				☐ Air Rotary		



Boring #: Project #: Date Completed:

B-207 0200054 6/16/00

Ground Surface El:
Depth to Ground Water:

4' 6"

N G **DESCRIPTION** L 0 W 6" Asphalt, 6" Gravel Fill: Black fine to coarse sand, some fine gravel, little silt, cinder, brick, (moist, dense) 51 5. - grading to loose @ 3' - grading to pieces of wood (wet) @ 5' 3 - grading to some coal tar @ 6' 10 5 -10 3 OH Gray organic silt with fibers (wet, soft) 212 11 2 SM Brown fine to medium sand, trace silt 15 11 Boring B-207 completed @ 42' on 6/16/00 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS Undisturbed Tube Sample Driller: HP M Rock Core Sample Client: **Bergen County DPW** Hollow Stem Auger Project: **River Road** ☐ Mud Rotary Location: Air Rotary Edgewater, NJ PLATE: 3H



Boring #: Project #: Date Completed:

B-208 0200054 6/21/00

Depth to Ground Water:

Ground Surface El: 10'

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	ļ.	21			-0		Fill: Brown fine to coarse sand, some silt (moist, medium dense)
-					-		- concrete obstruction from 2'-10'
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			-		-10		Gray organic silt (wet, very soft)
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_					-30	SM	Brown fine to coarse sand, little silt (wet, loose)
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		20 .				· .	- grading to (medium dense) @ 41'
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!				-+	<u></u>	- !	Boring B-208 completed @ 42' on 6/21/00 Blows per foot using 140# hammer with 30 inch drop.
PI		Gı					* Blows per foot using 300# hammer with 30 inch drop
	L	EG!					Project Manager: GF
٠.	E	=				n Samp	ble Field Engineer: WS
	Ĭ		R	Rock (Core	Samp	e Sample le
	С	lient:	E	Berg	en C	Count	y DPW
		oject:	F	Rive	Ro	ad	☐ Mud Rotary
	LOCE	ation:	E	dge	wat	er, N.	J Air Rotary
- 4							PLATE: 3I



Boring #:
Project #:
Date Completed:

B-209 0200054 6/22/00

Ground Surface El: Depth to Ground Water:

10' .

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٨	/IK Gro	auc	,		* Blows per foot using 140# hammer with 30 inch drop.		
_	LEGE				** Blows per foot using 300# hammer with 30 inch drop		·. ·
ć					Proj	ect Manager: G	F .
	ė	Split 8	opoo	n Sam	pie Fi	eld Engineer: V	VS
	-	Undis	turbe	ea Tub	e Sample	Driller: H	IP
		KOCK	Core	Samp	le		
1	Client:	Berg	en (Coun		Hollow Stem Auger	
	Project:	Rive	r Ro	ad		Mud Rotary	
l	ocation:	Edge	wat	ter, N		Air Rotary	
_						PLATE: 3	· · · ·
1						PLATE: 3	J



Boring #: Project #: Date Completed: 6/28/00

0200054

Ground Surface El: Depth to Ground Water:

	SAMPLES	A N E D T A R A D T I	RESISTANCE .	C A S I N G B L O W S	DEPTH FT	S M B O L	DESCRIPTION 1' Asphalt	% M O I S T U R E
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].	٠ .	•		ŀ	-40	SM	Brown fine to coarse sand, little silt (wet, medium dense)	
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L				ŀ			Boring B-210 completed @ 42' on 6/28/00	
F	N	iK Gro	וכ	מו	•	'	Blows per foot using 140# hammer with 30 inch drop.	'
	1	LEGE				<u></u> ľ	** Blows per foot using 300# hammer with 30 inch drop	OF.
'			S	olit S	poon	Samı	Project Manager: Field Engineer:	
			Ur R	ndist	urbe Core	d Tube Samp	Sample	
		Client:	В	erg	en C	ount	y DPW ☑ Hollow Stem Au	ger
		Project:	R	iver	Ro	ad	☐ Mud Rotary	J
<u></u>	L	ocation:	E	dge	wat	er, N.		
<u></u>			•				PLATE:	ЗК



Boring #: Project #: Date Completed:

B-211 0200054 6/23/00

Ground Surface El: Depth to Ground Water:

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. [7		T		-0		6" Topsoil		
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				:]	- grading to pieces of brick (very dense) @ 2'		
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	上			<u> </u>	ᅼ		Boring B-211 completed @ 42' on 6/23/00	`	
P	M	K Gr	OI	J'n			* Blows per foot using 140# hammer with 30 inch drop.		
H			_			·	** Blows per foot using 300# hammer with 30 inch drop		
		LEGE				_		Project Manager: GF	
i .			S	plit S	poo	n Sam		Field Engineer: WS	ĺ
ľ			Ū	ndist	urbe	ed Tub	e Sample	Driller: HP	
ľ						Sam			
		Client:	₿	erg	en (Coun	ty DPW	✓ Hollow Stem Auger	
		Project:	R	liver	·Ro	ad		Mud Rotary	
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Boring #:
Project #:
Date Completed:
Ground Surface El:
Depth to Ground Water:

PLATE: 3M

B-212 0200054 6/16/00

8'

A S I N G **DESCRIPTION** 9" Asphalt and Gravel Fill: Black fine to coarse sand, little fine gravel, some silt, brick (moist, dense) OH Gray organic silt (wet, loose) -20 -30 WOH 1 of 2 **PMK Group** Blows per foot using 140# hammer with 30 inch drop. ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS Undisturbed Tube Sample Driller: HP Rock Core Sample Client: Bergen County DPW ☑ Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: Edgewater, NJ Air Rotary



Boring #: Project #: Date Completed:

B-212 0200054 6/16/00

Ground Surface El: Depth to Ground Water:

PLATE: 3M

8' ESISTANCE T H **DESCRIPTION** ML Gray brown silt, some fine to medium sand (wet, stiff) SM Brown fine to coarse sand, some silt (wet, very dense) 68 Boring B-212 completed @ 47' on 6/16/00 -60 2 of 2 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS **Undisturbed Tube Sample** Driller: HP $\overline{\mathbf{m}}$ Rock Core Sample Client: Bergen County DPW ☑ Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: ☐ Air Rotary Edgewater, NJ



Boring #: B-213 Project #: 0200054 Date Completed: 6/22/00 Ground Surface El: Depth to Ground Water:

8'

DESCRIPTION Fill: Fine to coarse sand, some silt (moist, medium dense) 20 - grading to brick cinder (very dense) @ 21' 50 - concrete construction 4' 6" - 8' 50 OH Gray organic silt (wet, soft) WOH -0 WOH WOH SM Gray fine to coarse sand, some silt (wet, medium dense) 17 Boring B-213 completed @ 37' on 6/21/00 -40 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS Undisturbed Tube Sample Driller: HP Rock Core Sample Client: Bergen County DPW Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: ☐ Air Rotary Edgewater, NJ PLATE: 3N



Boring #: Project #: Date Completed: B-214 0200054 6/22/00 Ground Surface El: 4'

Depth to Ground Water:

S S P R C D S A T E E A E Y M A N S S P M P N E I I T B	M
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E A R T G L DESCRIPTION	s T
D T N B I DESCRIPTION	U R
N S W S	E
-0 10" Asphalt - Fill: Black fine to coarse sand, little silt (moist, very dense)	
■ 167 - grading to little fine gravel (wet) @ 4'	
100	
■ 3 - grading to (loose) @ 7'	
-15 OH Black organic silt (wet, soft)	
■ WOH	
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■ woh A =	
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■ WOH □	
-35 ML Brown silt, little fine sand (wet, stiff)	
9 - Slown Sitt, fittle line Saitu (Wet, Still)	
■ 41 -40 -41 -40 -41 -40 -41 -40 -41 -41 -41 -41 -41 -41 -41 -41 -41 -41	
- Boring B-214 completed @ 42' on 6/23/00	
* Blows per foot using 140# hammer with 30 inch drop.	. 1
The state of the s	
Split Spoon Sample	Manager: GF Engineer: WS
Undisturbed Tube Sample Rock Core Sample	Driller: HP
Client: Bergen County DPW	ow Stem Auger
Project: River Road	Rotary
Eugewater, NJ	PLATE: 30



Boring #: Project #: Date Completed:

PLATE: 3P

Ground Surface El:
Depth to Ground Water:

0200054 6/28/00 5'

B-215

N DESCRIPTION L O W S . 1' Asphalt Fill: Gray fine to coarse sand, little fine gravel, little silt (moist, dense) 50+ - grading to (wet, medium dense) @ 5' 11 100+ OH Black organic silt (wet, medium stiff) -10 - grading to (soft) @ 11' 2 WOH WOH 10 Gray silt, little fine to coarse sand (wet, stiff) Boring B-215 completed @ 37' on 6/28/00 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS Undisturbed Tube Sample Driller: HP Rock Core Sample Client: Bergen County DPW ☑ Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: Edgewater, NJ ☐ Air Rotary



Boring #:
Project #:
Date Completed:
Ground Surface El:

Depth to Ground Water:

B-216 0200054

E S ! S T **DESCRIPTION** OMITTED -20 -30 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS Undisturbed Tube Sample Driller: HP Rock Core Sample Client: Bergen County DPW ☑ Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: Edgewater, NJ ☐ Air Rotary PLATE: 3Q



Boring #: Project #: Date Completed: Ground Surface El: Depth to Ground Water:

B-217 0200054 6/19/00

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iid			17			-5		- grading to (medium dense) @ 5' - grading to (wet) @ 6'		•
g	_		48			Ξ		- grading to (dense) @ 7'		
	•							- grading to (medium dense) @ 9'		
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Boring #:
Project #:
Date Completed:
Ground Surface El:
Depth to Ground Water:

B-217 0200054 6/19/00

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		VII.	٦ľ	ou)	_	** Blows per foot using 300# hammer with 30 inch drop		i
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[ع						•		Project Manager:	GF
				Split	Spoo	n Sam	ple	Field Engineer: '	
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27		Ī	Ī.					Driller:	HP
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Boring #: Project #: Date Completed: B-218

0200054 6/21/00 Ground Surface El: Depth to Ground Water:

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			٠.		-		- wood obstruction 11' - 13'	
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₌ ·		5	4.		-20		- grading to (medium stiff) @ 21'	
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		2	l	Ì		, 1 m	- grading to (soft) @ 26'	
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l. '	ſ.			-[-40	SM	Brown fine to coarse sand, little silt (wet, loose)	
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P	М	KC) Gro	up			Blows per foot using 140# hammer with 30 inch drop.	
⊢	y					Ľ	** Blows per foot using 300# hammer with 30 inch drop	
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		Cliei	nt: i	Berg	en (Joun	ty DPW	jer .
	j. F	-roje	ct:	Rive	Ro	ad	☐ Mud Rotary	
	Lo	catio	n: I	Edge	wat	er, N	J ☐ Air Rotary	
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LOG OF BORING

Boring #: Project #: Date Completed: Ground Surface El:

B-219 0200054 6/22/00 Depth to Ground Water: 4'

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ł		1		_		- concrete obstruction 6'-7'		
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PI	MK Gr	יוס	ก	•		Blows per foot using 140# hammer with 30 inch drop.	* **	
1.					'	* Blows per foot using 300# hammer with 30 inch drop		
	LEGE						Project Manager:	GF
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•						Sample	Driller: I	
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4	Client:					y DPW	☑ Hollow Stem Auge	er
	Project:			Ro			☐ Mud Rotary	
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Boring #:
Project #:
Date Completed:
Ground Surface El:
Depth to Ground Water:

B-220 0200054

PMK Group Blows per foot using 140th nammer with 30 inch drop. LEGEND: Blows per foot using 300th hammer with 30 inch drop. LIGGEND: Split Spoon Sample Undistruted Tube Sample Client. Rock Core Sample Undistruted Tube Sample Client. Rock Core Sa	٠,	S A M	S T A	P F E I	CAS	D E P	S Y M		%
PMK Group **Blows per foot using \$40th hammer with 30 inch drop. **Blows per foot using \$300th hammer with 30 inch drop. **Blows per foot using \$300th hammer with 30 inch drop. **Blows per foot using \$300th hammer with 30 inch drop. **Blows per foot using \$300th hammer with 30 inch drop. **Blows per foot using \$10th hammer with 30 inch drop. **Blows per foo		P	N D	E T S	N		0.		0 .
PMK Group **Blows per foot using 140th hammer with 30 inch drop. **Blows per foot using 300th hammer with 30 inch drop. **Blows per foot us			R D	A				DESCRIPTION	S T
PMK Group Blows per foot using 140# harmer with 30 inch drop. Blows per foot using 300# harmer with 30 inch drop. Split Spoor Sample Undisturbed Tube Sample Client Bergen County DPW Project Manager: GF Field Engineer: WS Driller: HP Rock Core Sample Client Bergen County DPW I blows year foot using 140# harmer with 30 inch drop. Project Manager: GF Field Engineer: WS Driller: HP Project Manager: GF Field Engineer: WS Driller: HP Project Manager: GF Field Engineer: WS Driller: HP Rock Core Sample Client Bergen County DPW	B 17 18 12 1	200		0 E	0				R E
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PMK Group Blows per foot using 140# hammer with 30 inch drop. Blows per foot using 140# hammer with 30 inch drop. Blows per foot using 300# hammer with 30 inch drop. Undisturbed Tube Sample Undisturbed Tube Sample Rock Core Sample Client: Bergen County DPW Project River Road Hud Rotary Hud Rotary		1	Ask	-	╁	-0		OMITTED	
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LEGEND: Split Spoon Sample Undisturbed Tube Sample Rock Core Sample Client: Bergen County DPW Project: River Road Hollow Stem Auger Mud Rotary			B # 1 /					* Blows per foot using 140# hammer with 30 inch drop	
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Undisturbed Tube Sample Rock Core Sample Client: Bergen County DPW Project: River Road Driller: HP Driller: HP Driller: HP Driller: HP						Spoo	n Sam	Project Manager: GF	
Client: Bergen County DPW Project: River Road □ Mud Rotary		j	Ę		Undis	sturbe	d Tub	e Sample Driller HP	
Project: River Road		ŀ							
Location: Edgewater, NJ		į	Pro	ject:	Rive	r Ro	ad	☐ Mud Rotary	
	اً		Loca	tion:	Edge	ewat	er, N	J Air Rotary	:



LOG OF BORING

Boring #: B-223
Project #: 0200054
Date Completed: 6/20/00
Ground Surface EI:
Depth to Ground Water: 8'

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L	<u> </u>							Boring B-223 completed @ 42' on 6/20/00		····	=
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LOG OF BORING

Boring #: Project #: Date Completed: Ground Surface El:

B-224 0200054 6/22/00

Depth to Ground Water:

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				- 1]	- grading to pieces of brick @ 3'	
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				H		-5] .	- grading to some coal tar, little fine gravel (wet) @ 5'	
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Boring #: Project #: Date Completed: Ground Surface El: Depth to Ground Water:

B-225 0200054 6/27/00

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		⊢		12" Crushed Stone	
	ł	L	<u></u>	Fill: Black fine to coarse sand, little fine gravel, little silt, pieces of brick	
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MK G	roi	g		Blows per root using 140# hammer with 30 inch drop.	
				** Blows per foot using 300# hammer with 30 inch drop	
LEG				Project Manager (F.
	Sc	olit Sp	oon Sai		
	Ur	ndistru	bed Tu	1 loid Engineer, V	
īīī	ent: Bergen County DPW ect: River Road I Hollow Stem		IP .		
Client	:: Be	erger	ı Coui	ty DPW ☑ Hollow Stem Auge	r
Project	Split Spoon Sample Undisturbed Tube Sample Rock Core Sample ient: Bergen County DPW Hollow Ject: River Road		*. *		
Location					
	E(agew	ater, i	J Air Rotary	•
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Boring #:
Project #:
Date Completed:

B-225 0200054

Depth to Ground Water:

6/27/00 Ground Surface El: 8'

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Bask I	•	1	22					- grading to (medium dense) @ 46'	
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		1	• .			\vdash		- 63' to 64'-6" boulder	
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		•	90			-65 -		- grading to (very dense) @ 66'	
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F	٦N		Gr					* Blows per foot using 140# hammer with 30 inch drop. ** Blows per foot using 300# hammer with 30 inch drop	
		L	EGE			Snoo	n Com		Project Manager: GF
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17.	ι	Pr	Clien ojec	t: ı	Riva	r Do	he	ty DPW	☑ Hollow Stem Auger
	:	Loc	atior	ı: '	Edae	ewat	er, N		☐ Mud Rotary ☐ Air Rotary
<u>, </u>		-			- 5		,		DI ATE - 27



Boring #:
Project #:
Date Completed:
Ground Surface El:

PLATE: 3AA

Depth to Ground Water:

B-226 0200054 6/26/00

7

N G A R D **DESCRIPTION** . О W 1' Asphalt - concrete obstruction to 4' Fill: Black fine to coarse sand, some fine gravel, little silt (moist, medium dense) 19 100+ - grading to (wet, very dense) @ 7' 61 50/0" Black coal tar, some fine to coarse sand (wet, medium dense) 11 OH Gray organic silt (wet, soft) - grading to (medium stiff) @ 26 3 - grading to (soft) @ 31' -35 Gray fine to coarse sand, little silt (wet, medium dense) 17 Boring B-226 completed @ 42' on 6/26/00 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS **Undisturbed Tube Sample** Driller: HP Rock Core Sample Client: **Bergen County DPW** Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: Edgewater, NJ ☐ Air Rotary



Boring #: Project #: Date Completed: Ground Surface El: Depth to Ground Water:

B-227 0200054 6/19/00

8'

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						- grading to (wet) @ 8'
	13					- grading to (medium dense) @ 9'
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						- grading to (loose) @ 11'
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	MK Gr	ou	ıp		_ •	* Blows per foot using 300# hammer with 30 inch drop
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	. •			ומסמ	n Sam	Project Manager: GF
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		Ro	ck (JOLE	Samp	Driller: HP
	Client:					y DPW
,	Project:			Ro		☐ Mud Rotary
	Location:	Ed	lge [,]	wat	er, N.	Air Rotary
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Boring #: Project #: Date Completed: B-227 0200054 6/19/00

Ground Surface El: Depth to Ground Water:

8'

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H	•	. 1	6		-45		- grading to trace fine sand (very stiff)
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	D N		<u> </u>			- -	Blows per foot using 140# hammer with 30 inch drop.
Ľ	- IV		Gro)		* Blows per foot using 300# hammer with 30 inch drop
		LE	GEI			٠.,.	Project Manager, GE
			.	Split S	3poo	n Sam	Field Engineer: WS
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		Proje	-	Rive	r Ra	ad	y DPW ☐ Hollow Stem Auger ☐ Mud Rotary
	Lo	catio				er, N.	☐ Mud Rotary ☐ Air Rotary
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-							PLATE: 3BB



Boring #: Project #:

B-228 0200054 6/20/00

Date Completed: Ground Surface El: Depth to Ground Water:

8'

М В О DESCRIPTION 1' Asphalt Fill: Black fine to coarse gravel, some fine to coarse sand, little silt (moist, medium 15 10 - grading to some coal (dense) @ 5' 52 - grading to (wet, very dense) @ 8' 82 - grading to (loose) @ 10' 2 Gray organic silt (wet, very soft) -30 ML Gray silt, little fine sand (wet, stiff) 14 Boring B-228 completed @ 42' on 6/20/00 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS **Undisturbed Tube Sample** M Driller: HP Rock Core Sample Client: **Bergen County DPW** ☑ Hollow Stem Auger Project: **River Road** ☐ Mud Rotary Location: Edgewater, NJ Air Rotary PLATE: 3CC



Boring #: Project #: Date Completed:

0200054 6/22/00

Ground Surface El:
Depth to Ground Water:

8' .

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	1				-0		10" Asphalt		
1							Fill: Black fine to coarse sand, little fine gravel, little silt (moist, dense)		
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	•]	. 9			-10		- grading to (loose) @ 10'	1	
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: 1		21	-	. :]		- grading to coal tar (medium dense) @ 12'		
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C) N	IK G	·^	un	٠.		Blows per foot using 140# hammer with 30 inch drop.		
						!	Blows per foot using 300# hammer with 30 inch drop		
		LEGE	ΞN	D:				Project Manager Of	
1		7 D			nadi	n Sam	ie	Project Manager: GF	
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		Client:					/ DPW	☑ Hollow Stem Auger	
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) '	Ŀ	ocation:	-					☐ Air Rotary	
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Boring #:
Project #:
Date Completed:
Ground Surface El:
Depth to Ground Water:

B-229 0200054 6/22/00

8' .

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ACCES		11				- grading to (stiff) @ 46'		
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	_	69		-60		- grading to some fine gravel (very dense) @ 611		
	•	. 00	ļ.	\vdash		- grading to some fine gravel (very dense) @ 61'		
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		100+		-70	•	- grading to little silt @ 69'		
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		· vq	1	団		Boring B-229 completed @ 70' -6" on 6/22/00		
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	-11	MK Gro			<u></u>	** Blows per foot using 300# hammer with 30 inch drop		
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	ι	Project:	Rive				☑ Mud Rotary	-
Ld.	L	ocation:			er, N		☐ Air Rotary	
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Boring #: B-230
Project #: 0200054
Date Completed: 6/29/00
Ground Surface El:

PLATE: 3EE

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S	R D	A T I	A N O E	B . O	F	٠.	DESCRIPTION	T U R
		N	•	w s				-
,					-0		1' Asphalt	
_	1.	E4					Fill: Brown fine to coarse sand, little fine gravel, little silt (moist, dense)	-
•		54			<u> </u>			
					-5		4' - 7' concrete obstruction	
		•						
	1	^			·		- grading to (wet, loose) @ 8'	
		6 7			-10			
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	1 2				- -15		Black coal tar product (wet, loose)	
	1	7			-13	٠.	Black Coal fair product (wet, loose)	
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.	•	14	-	ſ	-40	SM	Gray fine to coarse sand, little silt (wet, medium dense)	
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	<u> </u>	•			·		Boring B-230 completed @ 42' on 6/29/00	
PI	VIK	G	ro	up	_	·	* Blows per foot using 140# hammer with 30 inch drop. ** Blows per foot using 300# hammer with 30 inch drop	
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7			R	lock (Core	Samp	pie	
h		lient oject	*	Berg Rive:			ty DPW	
2	Loca	ation:	-			ad or N	☐ Mud Rotary.	



Boring #: Project #: ate Completed:

Date Completed:
Ground Surface El:
Depth to Ground Water:

B-231 0200054 6/29/00

8'

ANDARD **DESCRIPTION** 1' Asphalt - concrete obstruction from 1' 6" - 2' 25 Fill: Black fine to coarse sand, some fine gravel, little silt (moist, dense) - 4' 6" to 7 concrete obstruction 100/3" Fill: Brown fine to coarse gravel, little fine to coarse sand, little silt (wet, loose) 3 100/3" -10 - grading to coal, tar @ 15' OH Gray organic silt (wet, soft) 2 -35 3 SM Brown fine sand and silt (wet, medium dense) 22 Boring B-231 completed @ 42' on 6/23/00 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS **Undisturbed Tube Sample** Driller: HP Rock Core Sample Client: Bergen County DPW ☑ Hollow Stem Auger Project: **River Road** ☐ Mud Rotary Location: ☐ Air Rotary Edgewater, NJ PLATE: 3FF



Boring #:
Project #:
Date Completed:
Ground Surface El:

B-232 0200054 6/19/00

8'

Depth to Ground Water:

N G A R D **DESCRIPTION** BLOW 1' Asphalt - concrete 1' - 2' Fill: Black fine to coarse sand, some fine to coarse gravel, some silt (moist and dense) 53 - grading to (very dense) @ 5' - grading to (wet) @ 8' - grading to (loose) @ 9' 8 10 - grading to coal tar @ 15' Gray organic silt (wet, soft) WOH WOH ML Gray silt, little fine sand (wet, soft) WOH -40 - grading to brown (very stiff) @ 41' 20 Boring B-232 completed @ 42' on 6/19/00 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS Undisturbed Tube Sample Driller: HP Rock Core Sample Client: **Bergen County DPW** Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: Air Rotary Edgewater, NJ PLATE: 3GG



LOG OF BORING

Boring #: Project #: Date Completed: B-233 0200054 6/29/00 Ground Surface El: Depth to Ground Water:

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	1-				\vdash	1	- grading to medium dense @ 4'	
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							* Blows per foot using 140# hammer with 30 inch drop.	
وسنا	Pi	VIK G	iro	un		.	The point doing in or maining with 30 literatup,	
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0:50	,	LEG	SEN	ID: ¯		-		
					_	_	Project Manager: GF	
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	,	ī		D	^-		e Sample Driller: HP	
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fige.		Clie	nt:	Ber	gen (Caun	ty DPW	
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Location:

Edgewater, NJ

LOG OF BORING

Boring #: Project #: Date Completed: Ground Surface El:

Air Rotary

PLATE: 311

B-234 0200054 6/26/00

Depth to Ground Water: **DESCRIPTION** o W 1' Asphalt Fill: Black fine to coarse sand, some fine to coarse sand, little silt, brick (moist, - grading to little fine gravel @ 2' 39 56 - 6'- 8' concrete obstruction 100+ 37 35 - grading to coal tar @ 15' 134 OH Gray organic silt (wet, soft) 15 - grading to (stiff) @ 31' Brown fine to medium sand, some silt (wet, loose) Boring B-234 completed @ 37' on 6/26/00 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Project Manager: GF Split Spoon Sample Field Engineer: WS Undisturbed Tube Sample Driller: HP Rock Core Sample Client: Bergen County DPW ☑ Hollow Stem Auger Project: **River Road** ☐ Mud Rotary



LOG OF BORING

Boring #: Project #: Date Completed:

Ground Surface El:

B-235 0200054 6/20/00

8'

Depth to Ground Water:

	SAMPLES	S P E S S I D A R A A D I C E	S-ZG BLO	E P T H	S Y M B O L	DESCRIPTION DESCRIPTION R E
		N	s s			8' Asphalt w/gravel underlay
		13 50/0"				Fill: Black fine to coarse sand, little fine to coarse gravel, little silt, concrete (moist, medium dense)
		103 100/0"		-5		
		16				- grading to (wet, medium dense) @ 8'
	•	27		-10		
		100/5"		-15		- grading to coal @ 15'
_		•				Gray organic silt (wet, very loose)
	•	2		-20	On	Gray organic siit (wet, very loose)
		5		-25		- grading to some fine to coarse sand (medium stiff) @ 26'
		· .			- Str	
		21		-30	SIVI	Brown fine to medium sand, trace silt (wet, medium dense)
Part Part S	# 4 P	9		-35	ML	Brown silt (wet, stiff)
				-40	SM	Brown fine sand and silt (wet, loose)
		4		-		Boring B-235 completed @ 42' on 6/20/00
}	PI	IK Gro)		* Blows per foot using 140# hammer with 30 inch drop. ** Blows per foot using 300# hammer with 30 inch drop
			Split Undi	isturbe	n Sam ed Tub e Samp	e Sample Driller: HP
		Client: Project:	Ber Riv	gen er Ro	Coun	ty DPW ☐ Hollow Stem Auger ☐ Mud Rotary



Boring #: Project #: Date Completed: Ground Surface El: Depth to Ground Water:

B-236 0200054

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ΡI	VΙΚ	G	ro	up			* Blows per foot using 140# hammer with 30 inch drop. ** Blows per foot using 300# hammer with 30 inch drop	
		EG			Snoo	n Sam	Project Manager: GF	
. 9			l	Jndis	turbe	d Tub	e Sample Driller: HP	
		III) Client				Samp Coun	ole ty DPW ☑ Hollow Stem Auger	
	Pr	ojec	t:	Rive	r Ro	ad	☐ Mud Rotary	
Location: Edgewater, N							IJ ☐ Air Rotary PLATE : 3KK	



Boring #:
Project #:
Date Completed:
Ground Surface El:
Depth to Ground Water:

B-237 0200054 6/20/00

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	5	D T	N	В	F		DESCRIPTION
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-	+			<u> </u>	-0		1' Asphalt
							Fill: Black fine to coarse sand, some fine to coarse gravel, little silt (moist, dense)
-		36			\vdash		
-		24				1	- grading to (medium dense) @ 4'
	.	15			-5	, ·	
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١.		39			 		- grading to (dense) @ 9'
-					-10		London Control of the Control of
		17			H	,	- grading to (medium dense) @ 11'
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		5			-20	ОН	Organic silt (wet, medium stiff)
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1.	-				-30	SM	Gray fine to medium sand, little silt (wet, medium dense)
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1.		•	1		-		Poring P 227 completed © 221 or 5/25/00
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F	M	IK G	ro	un			* Blows per foot using 140# hammer with 30 inch drop.
-		LEG				<u>-</u> 1	** Blows per foot using 300# hammer with 30 inch drop
'		•		Split 9		n Sam	
			_,,1	Undis	turbe	ed Tub	e Sample Driller: HP
		Clien				Samp Coun	ty DPW ☑ Hollow Stern Auger
· ;		Projec	t:	Rive			☐ Mud Rotary
L	L(ocatior				ter, N	
							PLATE: 3LL



Boring #: Project #: Date Completed: B-238 0200054 6/20/00

Ground Surface El: Depth to Ground Water:

6'

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	.	21		-5		Fill: Black fine to coarse sand, little fine gravel, trace silt (moist, medium dense)
"	'					- grading to pieces of wood (wet, dense) @ 6'
•	'	50	'			- obstruction from 8' to 9'
				-10		- grading to some coal tar @ 10'
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				-	OH	Gray organic silt (wet, soft)
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	, ,	2	ľ	-20	SIVI	Brown fine to medium sand, trace silt (wet, loose)
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	-			-25		- grading to little silt (medium dense) @ 25'
•		13		H		
		•		-30		Gray silt (wet, very stiff)
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	. -	12		-35		- grading to (stiff) @ 36'
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				-40		
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						Boring B-238 completed @ 42' on 6/20/00
Ī)/c	/IK Gr	วมถ			* Blows per foot using 140# hammer with 30 inch drop.
F	-	LEGE				** Blows per foot using 300# hammer with 30 inch drop Project Manager: GF
	9 ' - \$	•	Split		n Sam	ple Field Engineer: WS
					ed Tub e Samı	e Sample Driller: HP
,	,	Client:				nty DPW ☑ Hollow Stem Auger
		Project:	Rive	r Ro	oad	☐ Mud Rotary
		_ocation:	Edg	ewa	ter, N	· ·
,	1	Project: _ocation:				
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Boring #: Project #: Date Completed:

B-239 0200054 6/26/00

Ground Surface El:

Depth to Ground Water: . 6'

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-	19		.	-5		- grading to (medium dense) @ 4'	
	100+					- grading to (wet, very dense) @ 6'	
			ŀ			- 6" - 8' obstruction	٠.
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<u> </u>	6			-10		- grading to black fine to coarse sand, little silt, trace organics (loose) @ 10'	
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				-35	-	- grading to little fine sand @ 35'	٠.
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	. 11		ŀ			- grading to (stiff) @ 41'	
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				لنب		Boring B-239 completed @ 42' on 6/28/00 * Blows per foot using 140# hammer with 30 inch drop.	\dashv
PI	/IK Gr				. 1	** Blows per foot using 300# hammer with 30 inch drop	
	LEGE			'nooi	n Sam	Project Manager: GF	
i N		OF Ur	ndist	turbe	n Sam d Tub	ple Field Engineer: WS e Sample Driller: HP	
	III)	Ro	ock (Core	Samp		
	Client: Project:		_			ty DPW	
· ·	Location:			r Ro		☐ Mud Rotary ☐ Air Rotary	
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BLOWS.

LOG OF BORING

OMITTED

DESCRIPTION

Boring #: B-240 Project #: 0200054 Date Completed: Ground Surface El: Depth to Ground Water: Project Manager: GF Field Engineer: WS

Blows per foot using 140# hammer with 30 inch drop. **PMK Group** ** Blows per foot using 300# hammer with 30 inch drop LEGEND: Split Spoon Sample Undisturbed Tube Sample Driller: HP 面 Rock Core Sample ☑ Hollow Stem Auger Client: Bergen County DPW Project: River Road ☐ Mud Rotary Location: Edgewater, NJ ☐ Air Rotary **PLATE: 300**



Boring #: Project #:

B-241 0200054 6/21/00

Date Completed: Ground Surface El: Depth to Ground Water:

16'

ANC **DESCRIPTION** 8" Asphalt -0 50/0" Fill: Black fine to coarse sand, little fine gravel, concrete, little silt (moist, medium 50/0" 28 - obstruction (wood) @ 8-10' 35 - grading to pieces of brick @ 10' 14 - grading to (wet, loose) @ 16' Gray fine to coarse sand, little silt (wet, loose) - grading to (medium dense) @ 26' 14 ML Gray silt, little fine sand (wet, very stiff) 26 22 Blows per foot using 140# hammer with 30 inch drop. **PMK Group** Blows per foot using 300# hammer with 30 inch drop **LEGEND:** Project Manager: GF Split Spoon Sample Field Engineer: WS **Undisturbed Tube Sample** Driller: HP Rock Core Sample Client: Bergen County DPW Hollow Stem Auger Project: River Road ☐ Mud Rotary Location: ☐ Air Rotary Edgewater, NJ PLATE: 3PP



Boring #: Project #: Date Completed: Ground Surface El: Depth to Ground Water:

B-241 0200054 6/21/00

10'

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Agrange A	., ·	14	ļ. ·				- grading to stiff @ 41'
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<u>2</u>) .				Rock	Core	Samp	
0.00		Clier					ty DPW
	L	Projec ocatio		Rive			☐ Mud Rotary ☐ Air Rotary
E	- A			⊏age	:wa	ter, N	PLATE: 3PP



Boring #: Project #: B-242 Date Completed: Ground Surface El:

0200054 6/28/00 Depth to Ground Water: 6'

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上				-0		10" Asphalt
		. 1				Fill: Brown fine to coarse sand, some fine gravel, little silt, concrete (moist, dense)
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		113		一		- grading to (very dense) @ 4'
		:		-5		
•	۱ ۱	24		-		- grading to (wet, medium dense) @ 6' - pieces of wood @ 7'
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		23		-30		- grading to (medium dense) @ 31'
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-	<u></u>	·	L			* Blows per foot using 140# hammer with 30 inch drop.
<u> </u> F	- ا	MK Gr	oup			** Blows per foot using 300# hammer with 30 inch drop
	٠.	LEGE	ND:	,		Project Manager: GF
		_			n Sam	pple Field Engineer: WS
	:					pe Sample Driller: HP
1	i	Client:			e Samı	ple Ity DPW ☑ Hollow Stem Auger
1		Project:	Rive			Mud Rotary
	1	Location:			ter, N	
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Boring #: Project #: Date Completed: Ground Surface El: Depth to Ground Water:

B-243 0200054 6/26/00

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		-			-0		1' Asphalt Fill: Black fine to coarse sand, some fine to coarse gravel, little silt, brick (moist,	
		19					medium dense)	
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		13			-25		- grading to (medium dense) @ 26'	
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		11/					* Blows per foot using 140# hammer with 30 inch drop.	
	IV	IK C					** Blows per foot using 300# hammer with 30 inch drop	
		LE		ND: Split !	Snoo	n Sam	Project Manager: Gl	
				Undis	turb	ed Tub	pe Sample Driller: Hi	p
				Rock	Core	Samp		
		Clie: Proje:		Berg Rive			Ity DPW ✓ Hollow Stem Auger ☐ Mud Rotary	
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	_					,	PLATE : 3F	₹R



LOG OF BORING

B-244 Boring #: 0200054 Project #: Date Completed: Ground Surface El: Depth to Ground Water:

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				. }	긕			
7.,					긤			
Р	MŁ	(Gi	ro	up			* Blows per foot using 140# hammer with 30 inch drop. ** Blows per foot using 300# hammer with 30 inch drop	
1		LEG				·	Project Manager: Gl	F .
			S	Split S	Spoo	n Sam	ple Field Engineer: W	'S
			U	Indis	turbe	d Tub	e Sample Driller: HI	Р .
1			R	cock	Core	Samp	ole ty DPW ☑ Hollow Stem Auger	
4	į P	roject:					ty DPW ✓ Hollow Stem Auger ☐ Mud Rotary	
	Loc	ation:		Rive		oad ter, N		
2				-uge	=wa	ter, N	J PLATE: 3S	SS

Λ	MAJOR DIVISIO	VS
COARSE	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)
GRAINED SOILS	MORE THAN 50% OF COURSE FRAC- TION <u>RETAINED</u> ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)
MORE THAN 50%	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)
OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COURSE FRAC- TION <u>PASSING</u> NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)
SINE		
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50
MORE THAN 50% OF MATERIAL IS <u>SMALLER</u> THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50

	LETTER SYMBOL
·.	GW
	GP
	GM
	GC
	SW
	SP
	SM
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	ML
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TYPICAL DESCRIPTIONS
WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
SILTY SANDS, SAND-SILT MIXTURES
CLAYEY SANDS, SAND-CLAY MIXTURES
INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDS CLAYS, SILTY CLAYS, LEAN CLAYS
ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

GRADATION*

% FINER BY WEIGHT

COMPACTNESS* SAND AND/OR GRAVEL

> RELATIVE DENSITY

CONSISTENCY*
CLAY AND/OR SILT

RANGE OF SHEARING STRENGTH IN POUNDS PER SQUARE FOOT

VERY SOFT	LESS THAN 250
SOFT	250 TO 500
MEDIUM	500 TO 1000
STIFF	1000 TO 2000
VERY STIFF	2000 TO 4000
HARDG	REATER THAN 4000

VALUES ARE FROM LABORATORY OR FIELD TEST DATA, WHERE APPLICABLE. WHEN NO TESTING WAS PERFORMED, VALUES ARE ESTIMATED.

UNIFIED SOIL CLASSIFICATION SYSTEM

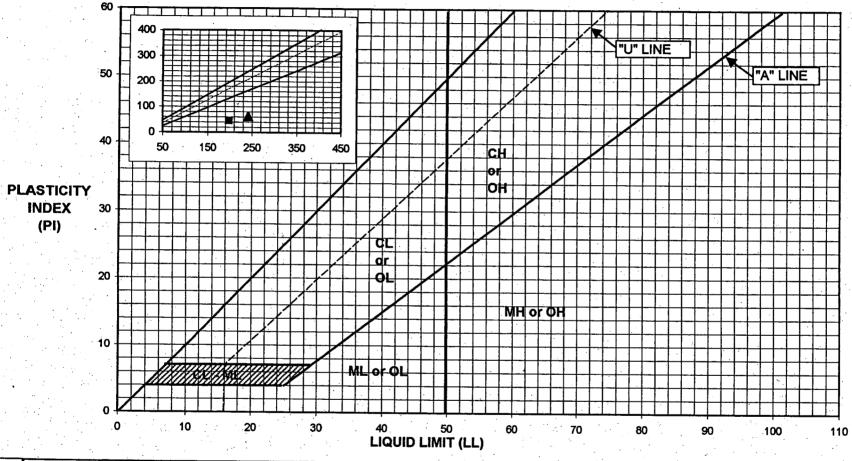
SOIL CLASSIFICATION CHART



PROJECT NO. 200054

DATE: 6/28/2000

ATTERBERG LIMITS



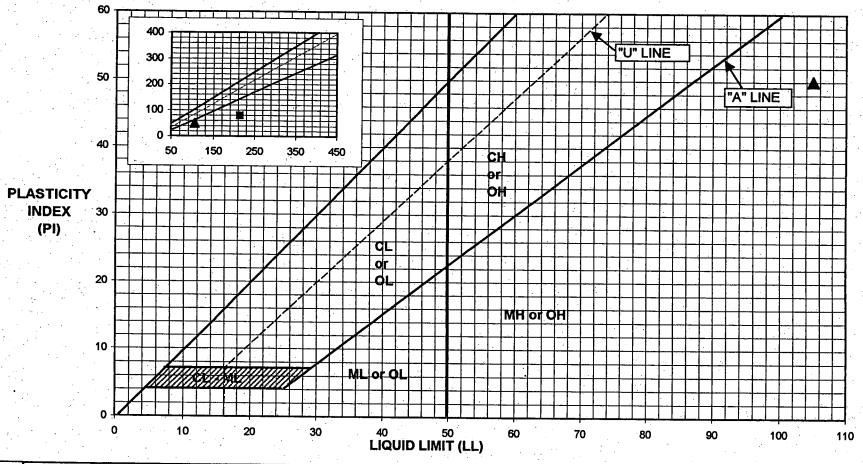
	LOCATION	SAMPLE	DEPTH		CLASSIFICATION	% MOISTURE	LL	PL	PI
	B-222	S-9	25-27'	ОН	DARK GRAY ORGANIC SILT WITH FIBERS	171	198	152	46
A	B-207	S-7	15-17'	ОН	DARK GRAY ORGANIC SILT WITH FIBERS	212	242	181	61



PROJECT NO. 200054

DATE: 6/28/2000

ATTERBERG LIMITS



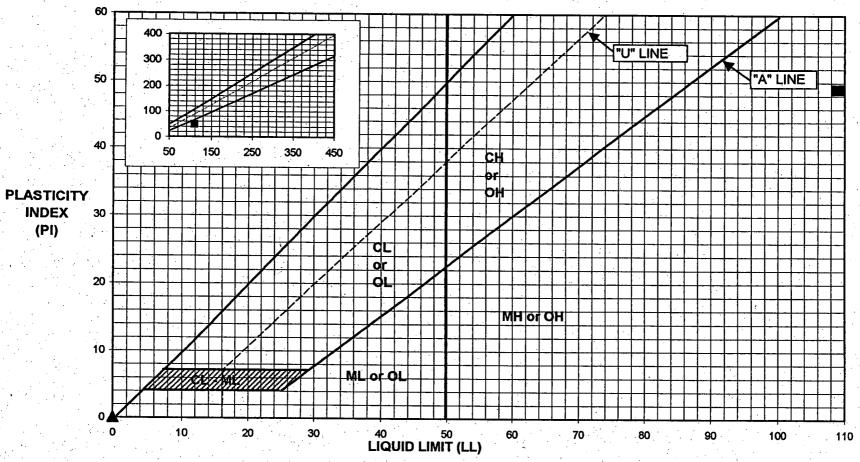
■ B-219 S-7 20-22' OH BLACK ORGAINC SILT 192 214 134 80 ▲ B-211 S-8 15-17' OH DARK GRAY ORGANIC SILT 69 105 55 50	-	LOCATION	SAMPLE	DEPTH		CLASSIFICATION	% MOISTURE	LL [PL	PI
▲ B-211 S-8 15-17' OH DARK GRAY ORGANIC SILT 69 105 55 50		B-219	S-7	20-22'	ОН	BLACK ORGAINC SILT	192	214	134	80
		B-211	S-8	15-17'	ОН	DARK GRAY ORGANIC SILT	69	105	55	50



PROJECT NO. 200054

DATE: 6/28/2000

ATTERBERG LIMITS



_	LOCATION	SAMPLE	DEPTH		CLASSIFICATION	% MOISTURE	LL	PL	PI
	B-227	S-9	30-32'	ОН	DARK GRAY ORGANIC SILT	89	109	60	49



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APPENDIX



APPENDIX LIMITATIONS

A. SUBSURFACE INFORMATION

<u>Locations</u>: The locations of the explorations were determined by tape measurement from existing site features. Elevations of the explorations were not determined for this study. The locations of the explorations should be considered accurate only to the degree implied by the method used.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundary between soil types, and the transition may be gradual. The stratum lines shown on soil profiles are based upon interpolation between explorations and may not represent actual subsurface conditions.

<u>Field Logs/Final Logs</u>: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples.

We must emphasize that our recommendations are based on the final logs and the information contained therein, and not on the field logs.

The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and tests of the field samples. The final logs are included in the engineering report.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. This data has been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors at the time measurements were made.

<u>Pollution/Contamination</u>: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.



<u>Environmental Considerations</u>: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. <u>APPLICABILITY OF REPORT</u>

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of Bergen County for specific application to design of the Remediation of River Road. No other warranty, expressed or implied, is made.

C. REINTERPRETATION OF RECOMMENDATIONS

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the roadway are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

<u>Changed Conditions During Construction</u>: The analyses and recommendations submitted in this report are based in part upon the data obtained from 41 widely-spaced test boring performed for this study. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

<u>Changes in State-of-the-Art</u>: The conclusions and recommendations contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

Use of Report by Prospective Bidders: This soil and foundation engineering report was prepared for the project by the **PMK Group** for design purposes only, and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the expressed understanding that its scope is limited to design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations or data gathering they deem necessary to prepare their bid accurately.

Construction Observation: We recommend that the **PMK Group** be retained to provide on-site soils engineering services during the earthwork construction and foundation phases of the work. This is to observe compliance with the design concepts and to allow changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.